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United States Department of Agriculture,

BUREAU OF SOILS—CIRCULAR No. 72.

MILTON WHITNEY, Chief.

UNITED STATES DEPARTMENT OF AGRICULTURE,

Washington, D. C., June 22, 1912.

SIR: At the time of making the soil survey of the Gainesville area, Florida, Payne Prairie or Alachua Lake, covering a large area near Gainesville, was filled with water and the soils lying in this basin were not shown upon the soil map. Later this area was uncovered and a request was made that the soils therein be classified. The bureau acceded to this request, but before the work could be taken up the water had again risen and covered a considerable portion of the prairie. Nevertheless, an expert from the bureau made an examination of the soils so far as this could be done. The accompanying manuscript and sketch map embody the results of this investigation. I have the honor to request that this matter be published as Circular 72 of the Bureau of Soils.

Very respectfully,

MILTON WHITNEY,

Chief of Bureau.

HON. JAMES WILSON,

Secretary of Agriculture.

SOIL SURVEY OF PAYNE PRAIRIE, GAINESVILLE AREA, FLORIDA.

By CHARLES N. MOONEY.

Payne Prairie is an irregular-shaped basin lying in Alachua County. Roughly, its shape is that of the letter "T," the stem being short. The basin is about 8 miles long east and west and varies from $1\frac{1}{2}$ to 4 miles wide north and south. It is situated about 2 miles from Gainesville.

Geologically it lies in a limestone section, and it owes its origin to the solution of the underlying limestone beds and the formation of a large sink or basin. The soils are made up partly of the original material lying on the limestone before the formation of the sink and partly of later accumulations by wind and water. At the present time the basin, while of irregular shape, gradually slopes from the margin toward the center, as indicated by the water level and depths. To the eye, except on the very margins, the surface looks flat, in fact, there is only a few feet change in elevation, the topographic sheet not showing as much as 10 feet. There occur a number of depressions or ponds in this basin that are somewhat below the general level. The lower levels are toward the eastern end of the lake, the drainage being toward Prairie Creek and

Alachua Sink. This creek enters from the east and, curving northward, finds outlet into what is called Alachua Sink on the northern boundary of the Prairie. This creek is the outlet of Newnans Lake and a chain of lakes connected with it. Newnans Lake is only a mile or two northeast of the eastern end of Payne Prairie.

Payne Prairie is intermittently covered by water which has been in the past of sufficient depth to permit the use of small steamboats. It then goes dry or nearly dry for a few years and again is covered with water. For the last three years the basin has been practically dry, but the rains of the past winter have filled Newnans Lake and the bodies of water associated with it to overflowing and their waters are discharging by Prairie Creek into Payne Prairie faster than they can be carried out by Alachua Sink so that at the present time the waters are rising and all except a border of a few hundred yards along the margin of the Prairie is under water ranging in depth from a few inches over the general surface to several feet in the troughs and depressions.

Five types of soil were encountered within the Prairie proper. These are all closely related and vary according to position. Having been covered by water more or less and supporting a rank-growing vegetation of weeds, grasses, and sedges, there has accumulated considerable organic matter in the surface from the decay of this vegetation.

Four of these soils, under the soil classification, belong to the Portsmouth series, having dark to mucky surface soils and drab-colored subsoils. The fifth type is the Leon sand, being the pond phase of the type.

The description of the different types as encountered is as follows:

Portsmouth sandy loam.—This type is found as a continuous border around the Prairie extending from the margin out on an average about one-fourth mile. It dips slightly from the margin toward the center. The change in elevation, however, is slight. It consists of a black loamy to mucky medium sand, in a few small areas practically muck, ranging in depth from 8 to 15 inches. Below this is a drab or brownish-drab, water-soaked, medium-textured sand, and this in turn rests upon bluish-drab colored sandy clay, very stiff and plastic, although quite sandy. In places it is a lighter drab and it generally becomes lighter in color with depth. Some of it is mottled slightly with brown and yellow and occasionally some streaks of red occur. On the south side of the Prairie some spots were found that were decidedly mottled. The clay is generally encountered within 24 inches of the surface, but the depth to this material is extremely variable within short distances and places were found where the drab sand continued to a depth of more than

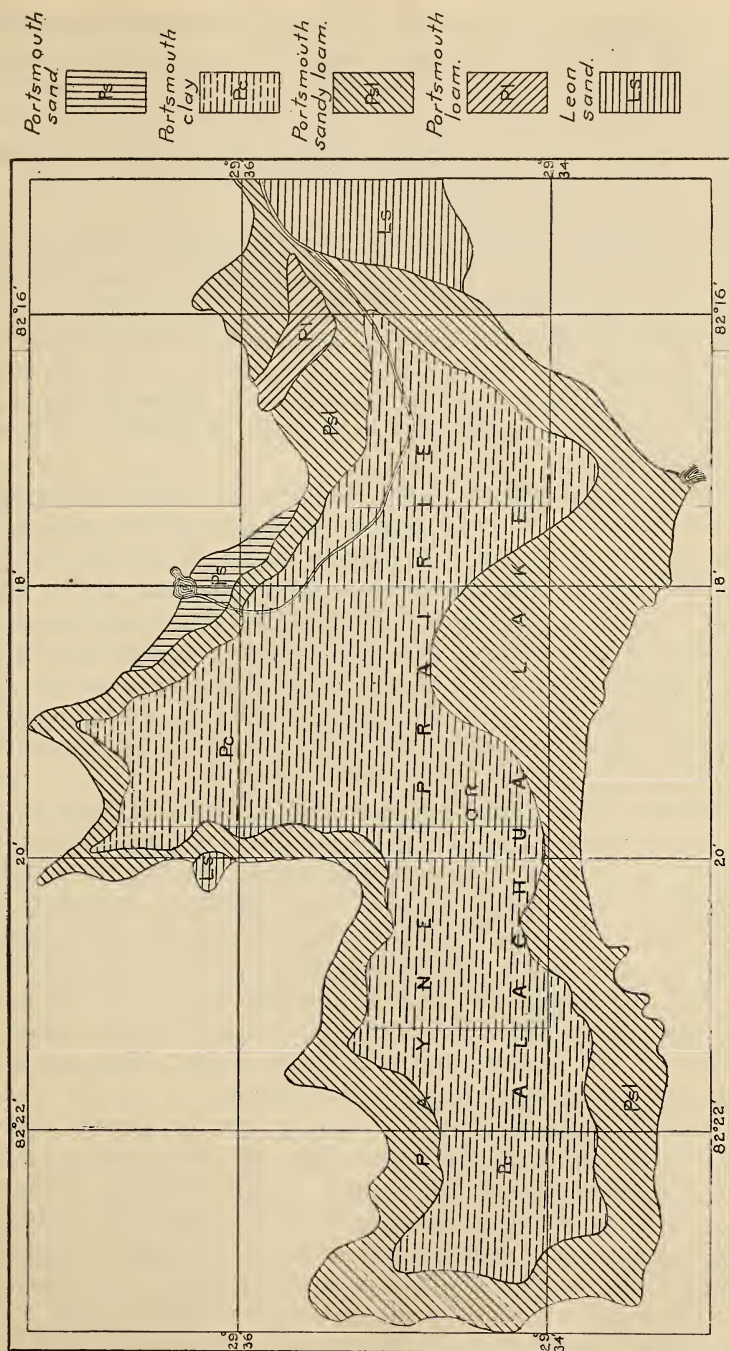


FIG. 1.—Soil map of Payne Prairie, Florida.

36 inches, though in this case the lower part is generally somewhat sticky from the clay it contains. Again the clay may be encountered almost at the surface. Toward the outer edge of the basin the subsurface soil is deeper and the surface soil not so dark or deep, while toward the center the black surface layer is uniformly deeper and more mucky. This type represents the part which is mostly out of water at the present time.

This soil supports a strong sod of broom sedge and a coarse-bladed grass. During the last few dry seasons the broom sedge has taken hold of this part of the basin. Dogfennel and sow thistles are conspicuous weed growths and also the "coffee bean," a weed that grows luxuriantly upon this class of soils. The water in the lake is encroaching upon this soil at the present time. Some higher spots have been cultivated to corn and have given 50 bushels to the acre in favorable seasons.

Portsmouth sand represents the condition where the sand exceeds 36 inches in depth. There is only a small area of this, and it lies next to the rim of the basin at Alachua Sink. It consists of black to grayish-black medium sand or loamy medium sand, with a depth of 8 or 10 inches, underlain by light drab colored medium sand. This type is largely made up of the wash from the immediate slopes. While it tends to a grayish color, it has been submerged enough, and, with the growth and decay of vegetation, has had enough organic matter left in it to darken the immediate surface. Broom sedge and dogfennel are the predominant growths upon it.

Portsmouth loam.—At the eastern end of the lake basin on the north side of Prairie Creek there is a small area of Portsmouth loam. It occurs in a slight troughlike depression. At the time of this survey it was indicated by a very rank growth of dogfennel and "coffee bean." The soil consists of a black mucky loam or almost a muck to about 15 inches, and immediately overlies stiff plastic sticky sandy clay, like gumbo, and of bluish to light-drab color. In a few inches the subsoil becomes mottled or streaked with yellow or yellowish-red, the mottling increasing with depth. This soil is the nearest approach to muck found in the Prairie.

Portsmouth clay.—This type covers by far the greater part of Payne Prairie, and is at the present time all under water, varying from a few inches to some feet in depth. Only where the water was shallow could examination be made by driving into it, but driving in here and there some distance, and across the Prairie in the vicinity of Rocky Point, an idea of the type could be formed. The area of this soil is roughly defined by the growth of "maiden cane" and a water-loving grass that grows under similar conditions. There are a number of open ponds without any growth, representing deeper basins in the Prairie; also places where water bonnets and water

lilies are growing. The greater part of this type was found to have a soil consisting of 3 to 5 inches of black mucky sandy clay, though in places there was found a slight covering of white or brownish sand. The subsoil consists usually of dark-drab sandy clay, changing to a lighter drab with depth, and showing often some yellow streaks or mottles. Some borings were light colored in the lower depths, and would probably prove of somewhat calcareous character. The subsoil is very stiff, and, though sandy, is tough and plastic. Residents around the Prairie say that there are areas of outcrop of flinty rocks, probably the flinty part of the Vicksburg limestone, and that in the "bonnet ponds and lily ponds" the soil is mucky and boggy, the muck being several feet deep. They also report that there are sandy bars in this lake portion and considerable variation as a whole. As the depth of water was too great to permit driving through the central portion of the Prairie, this section could not be examined to verify the statements of the residents. This is considered a very strong soil and desirable if drained.

Leon sand (pond phase).—This type is found at the eastern end of the Prairie beyond what is shown as the water line, but has been submerged when the prairie was filled with water in times past.

The type consists of dark-gray to gray medium sand averaging about 15 inches in depth, under which is found a chocolate-brown medium sand extending to a depth of more than 36 inches, the dark-brown color gradually changing to brownish gray and finally to white. This brown substratum is known as "hardpan." Dogfennel is the predominant growth on this soil.

There is a small area reaching from Chacala Pond to the north within the prairie basin and extending east over the 60-foot contour that consists of a brownish-gray to drab medium sand underlain by drab sand to a depth of over 36 inches, but resting at no great depth upon drab clay mottled with streaks of yellow. It supports a hammock growth and cabbage palmettos. It also extends over the high hammock lands bordering the prairie. This is the Fellowship land as mapped in the Ocala area.

Payne Prairie is considered the best summer grazing section in this part of Florida. It supports a luxuriant grazing growth and cattle thrive upon it. However, all this growth dies down in the late fall and cattle can hardly subsist upon it during the winter. In its present condition, it is best suited to grazing, while if drained thoroughly and then irrigated, if found necessary, it would be suited to general farm crops and a great variety of trucking crops as well.

Approved:

JAMES WILSON,
Secretary of Agriculture.

WASHINGTON, D. C., June 26, 1912.

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